2014

Test 2087: Challenger MT755E

Nebraska Tractor Test Laboratory
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NEBRASKA OECD TRACTOR TEST 2087–SUMMARY 936
CHALLENGER MT755E DIESEL
16 SPEED

Location of tests: Nebraska Tractor Test Laboratory, University of Nebraska, Lincoln, Nebraska 68583-0832

Dates of tests: May 27 to June 2, 2014

Manufacturer: AGCO Corporation, 4205 River Green Parkway, Duluth Ga 30096

POWER TAKE-OFF PERFORMANCE

Power HP *(kW)*	Crank shaft speed rpm	Diesel Consumption Gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	D.E.F. Consumption Hp.hr/gal *(kW.h/l)*	D.E.F. Consumption Gal/hr *(l/h)*	Mean Atmospheric Conditions
MAXIMUM POWER AND FUEL CONSUMPTION						
Rated Engine Speed—(PTO speed—1060 rpm)						
284.78 *(212.36)*	2099	18.30 *(69.26)*	0.451 *(0.274)*	15.56 *(3.07)*	1.10 *(4.17)*	
Standard Power Take-off Speed (1000 rpm)						
316.05 *(235.68)*	1980	18.71 *(70.82)*	0.415 *(0.253)*	16.89 *(3.33)*	1.27 *(4.82)*	
Maximum Power (1 hour)						
326.14 *(243.20)*	1800	18.01 *(68.16)*	0.387 *(0.236)*	18.11 *(3.57)*	1.26 *(4.78)*	
VARYING POWER AND FUEL CONSUMPTION						
284.78 *(212.36)*	2099	18.30 *(69.26)*	0.451 *(0.274)*	15.56 *(3.07)*	1.10 *(4.17)*	Air temperature
248.38 *(185.22)*	2155	16.85 *(63.79)*	0.476 *(0.290)*	14.74 *(2.90)*	0.90 *(3.40)*	78°F *(26°C)*
187.40 *(139.74)*	2164	13.78 *(52.16)*	0.516 *(0.314)*	13.60 *(2.68)*	0.53 *(1.99)*	Relative humidity
125.34 *(93.46)*	2172	10.13 *(38.36)*	0.567 *(0.345)*	12.37 *(2.44)*	0.28 *(1.07)*	57%
62.82 *(46.85)*	2179	7.13 *(26.97)*	0.796 *(0.484)*	8.82 *(1.74)*	0.28 *(1.04)*	Barometer
2.65 *(1.97)*	2187	4.45 *(16.85)*	11.799 *(7.177)*	0.59 *(0.12)*	0.23 *(0.87)*	28.71" Hg *(97.22 kPa)*

Maximum torque - 1160 lb.-ft. *(1573 Nm)* at 1101 rpm
Maximum torque rise - 62.7%
Torque rise at 1680 engine rpm - 42%
Power increase at 1800 engine rpm - 14.5%

DRAWBAR PERFORMANCE (Unballasted)
FUEL CONSUMPTION CHARACTERISTICS

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Fuel Consumption Hp.hr/gal *(kW.h/l)*	D.E.F. Consumption lb/hp.hr *(kg/kW.h)*	Temp.°F *(°C)* cool-ing med	Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Power—8th Gear										
252.35 *(188.18)*	16795 *(74.71)*	5.64 *(9.07)*	2100	2.2	0.511 *(0.311)*	13.72 *(2.70)*	0.036 *(0.022)*	188 *(87)*	69 *(20)*	28.71 *(97.22)*
75% of Pull at Maximum Power—8th Gear										
196.29 *(146.37)*	12581 *(55.96)*	5.85 *(9.41)*	2160	1.2	0.541 *(0.329)*	12.96 *(2.55)*	0.039 *(0.024)*	189 *(87)*	82 *(28)*	28.72 *(97.26)*
50% of Pull at Maximum Power—8th Gear										
132.71 *(98.96)*	8416 *(37.43)*	5.91 *(9.51)*	2170	0.6	0.598 *(0.364)*	11.74 *(2.31)*	0.026 *(0.016)*	188 *(87)*	84 *(29)*	28.73 *(97.29)*
75% of Pull at Reduced Engine Speed—11th Gear										
196.76 *(146.72)*	12675 *(56.38)*	5.82 *(9.37)*	1505	1.2	0.431 *(0.262)*	16.28 *(3.21)*	0.039 *(0.024)*	184 *(84)*	82 *(28)*	28.71 *(97.22)*
50% of Pull at Reduced Engine Speed—11th Gear										
132.48 *(98.79)*	8377 *(37.26)*	5.93 *(9.54)*	1525	0.6	0.465 *(0.283)*	15.10 *(2.98)*	0.040 *(0.024)*	183 *(84)*	85 *(29)*	28.73 *(97.29)*

CONSUMABLE Fluids, OIL and TIME: Fuel No. 2 Diesel **Specific gravity converted to 60°/60°F *(15°/15°C)*** 0.8429 **Fuel weight** 7.018 lbs/gal *(0.841 kg/l)* **Diesel Exhaust Fluid (DEF)** 32% aqueous urea solution **DEF weight** 9.071 lbs/gal *(1.087 kg/l)* **Oil SAE** 15W-40 **API service classification** CJ-4 **Transmission and hydraulic lubricant** AGCO Permatran 821 XL fluid **Total time engine was operated:** 20.0 hours

ENGINE: Make AGCO Power Diesel **Type** seven cylinder vertical with two turbochargers, water to air intercooler, air to air intercooler and D.E.F. (diesel exhaust fluid) technology **Serial No.** *Z36358* **Crankshaft** lengthwise **Rated engine speed** 2100 **Bore and stroke** 4.370" x 5.709" *(111.0 mm x145.0 mm)* **Compression ratio** 16.7 to 1 **Displacement** 599 cu in *(9822 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements and aspirator **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** one paper element and water separator **Fuel cooler** radiator for pump return fuel **Muffler** vertical **Cooling medium temperature control** 2 thermostats and variable speed fan

ENGINE OPERATING PARAMETERS: Fuel rate: 119.1 - 128.6 lb/h *(54.0 - 58.3 kg/h)* **High idle:** 2150 - 2200 rpm **Turbo boost:** nominal 34.8 - 37.7 psi *(240 - 260 kPa)* as measured 35.8 psi *(247 kPa)*

CHASSIS: Type Tracklayer-rubber tracked **Serial No.** *AGCC0765AENCD1002* **Track width** 88.0" *(2235 mm)* to 119.5" *(3035 mm)* **Length of track on ground** 102.4" *(2600 mm)* **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with full range operator controlled power shift **Nominal travel speeds mph *(km/h)*** first 1.66 *(2.67)* second 2.11 *(3.40)* third 2.66 *(4.28)* fourth 3.38 *(5.44)* fifth 4.03 *(6.49)* sixth 4.54 (*7.31)* seventh 5.12 *(8.24)* eighth 5.76 *(9.27)* ninth 6.48 *(10.43)* tenth 7.29 *(11.73)* eleventh 8.22 *(13.23)* twelfth 9.26 *(14.90)* thirteenth 11.02 *(17.73)* fourteenth 14.00 *(22.53)* fifteenth 17.72 *(28.52)* sixteenth 24.64 *(39.65)* at 2300 rpm, reverse 1.33 *(2.14)*, 3.22 *(5.18)*, 3.63 *(5.84)*, 8.82 *(14.19)* **Clutch** wet multiple disc hydraulically actuated by foot pedal **Brakes** wet multiple disc hydraulically actuated by foot pedal **Steering** electro-hydraulic differential steering controlled by steering wheel **Power take-off** 1000 rpm at 1980 engine rpm **Unladen tractor mass** 33235 lb *(15075 kg)*

DRAWBAR PERFORMANCE
Unballasted at 2100 RPM
DRAWBAR POWER IN SELECTED GEARS

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	D.E.F. Consumption lb/hp.hr *(kg/kW.h)*	Temp.°F(°C) cool-ing med	Air dry bulb	Barom. inch Hg *(kPa)*
					3rd Gear					
196.30	31032	2.38	2108	11.3	0.578	12.15	0.033	189	67	28.76
(146.38)	*(138.03)*	*(3.82)*			*(0.351)*	*(2.39)*	*(0.020)*	*(87)*	*(20)*	*(98.39)*
					4th Gear					
233.46	28132	3.12	2099	7.9	0.550	12.76	0.040	190	71	28.75
(174.09)	*(125.14)*	*(5.01)*			*(0.335)*	*(2.51)*	*(0.024)*	*(88)*	*(22)*	*(97.36)*
					5th Gear					
244.38	23972	3.83	2100	5.0	0.525	13.38	0.038	190	74	28.73
(182.23)	*(106.63)*	*(6.16)*			*(0.319)*	*(2.64)*	*(0.023)*	*(88)*	*(24)*	*(97.29)*
					6th Gear					
251.64	21590	4.37	2100	3.6	0.512	13.72	0.037	189	76	28.71
(187.64)	*(96.03)*	*(7.03)*			*(0.311)*	*(2.70)*	*(0.022)*	*(87)*	*(24)*	*(97.22)*
					7th Gear					
250.49	18861	4.98	2100	2.6	0.513	13.67	0.037	188	71	28.71
(186.79)	*(83.90)*	*(8.01)*			*(0.312)*	*(2.69)*	*(0.022)*	*(87)*	*(22)*	*(97.22)*
					8th Gear					
252.35	16795	5.64	2100	2.2	0.511	13.72	0.036	188	69	28.71
(188.18)	*(74.71)*	*(9.07)*			*(0.311)*	*(2.70)*	*(0.022)*	*(87)*	*(20)*	*(97.22)*
					9th Gear					
250.08	14718	6.37	2100	1.6	0.514	13.65	0.037	189	78	28.72
(186.48)	*(65.47)*	*(10.25)*			*(0.313)*	*(2.69)*	*(0.022)*	*(87)*	*(25)*	*(97.26)*
					10th Gear					
251.22	13094	7.20	2099	1.2	0.512	13.70	0.037	189	78	28.72
(187.33)	*(58.24)*	*(11.58)*			*(0.312)*	*(2.70)*	*(0.023)*	*(87)*	*(26)*	*(97.26)*
					11th Gear					
245.71	11321	8.14	2099	0.9	0.523	13.43	0.039	189	79	28.71
(183.22)	*(50.36)*	*(13.10)*			*(0.318)*	*(2.65)*	*(0.024)*	*(87)*	*(26)*	*(97.22)*

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

Note 1: The performance figures on this report are the result of replacing the electronic engine control module of the Challenger MT765E with the Challenger MT755E module.

Note 2: This tractor has a driveline protection system that limits the maximum engine torque in gears 1 through 4.

REMARKS: All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. For the maximum power tests the fuel temperature at the injection pump inlet was maintained at 96°F *(36°C)*. The pe rformance figures on this summary were taken from a test conducted under the OECD Code 2 test procedure.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **2087**, Nebraska Summary 936, December 19, 2014.

Roger M. Hoy
Director

M.F. Kocher
J.D. Luck
P.J. Jasa
Board of Tractor Test Engineers

TRACTOR SOUND LEVEL WITH CAB	dB(A)
At no load in 6th gear	72.0
Bystander in 16th gear	89.7

TIRES, BALLAST AND WEIGHT	With Ballast	Without Ballast
Track width	25.0 in *(635 mm)*	25.0 in *(635 mm)*
Ballast - Cast iron(front end)	3245 lb *(1472 kg)*	None
- Cast iron(front idlers)	2345 lb *(1064 kg)*	None
Height of Drawbar	21.0 in *(535 mm)*	20.0 in *(510 mm)*
Static Weight with operator	39000 lb*(17690 kg)*	33410 lb*(15154 kg)*

DRAWBAR PERFORMANCE
(Unballasted at 1800 RPM)
MAXIMUM POWER IN SELECTED GEARS

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	D.E.F. Consumption lb/hp.hr *(kg/kW.h)*	Temp.°F*(°C)* cool-ing med	Air dry bulb	Barom. inch Hg *(kPa)*
					3rd Gear					
196.75 *(146.71)*	31059 *(138.16)*	2.38 *(3.83)*	2119	11.6	0.583 *(0.355)*	12.04 *(2.37)*	0.031 *(0.019)*	189 *(87)*	67 *(20)*	28.75 *(97.36)*
					4th Gear					
236.11 *(176.07)*	29956 *(133.25)*	2.96 *(4.76)*	2050	10.5	0.550 *(0.334)*	12.76 *(2.51)*	0.040 *(0.024)*	189 *(87)*	72 *(22)*	28.76 *(97.39)*
					5th Gear					
262.42 *(195.68)*	28838 *(128.28)*	3.41 *(5.49)*	1958	9.1	0.502 *(0.305)*	13.98 *(2.75)*	0.043 *(0.026)*	190 *(88)*	74 *(24)*	28.77 *(97.42)*
					6th Gear					
271.03 *(202.11)*	27947 *(124.31)*	3.64 *(5.86)*	1839	8.4	0.473 *(0.288)*	14.85 *(2.92)*	0.042 *(0.026)*	188 *(87)*	75 *(24)*	28.77 *(97.43)*
					7th Gear					
279.21 *(208.20)*	25243 *(112.28)*	4.15 *(6.67)*	1800	5.4	0.454 *(0.276)*	15.45 *(3.04)*	0.039 *(0.024)*	187 *(86)*	72 *(22)*	28.71 *(97.22)*
					8th Gear					
284.46 *(212.12)*	22532 *(100.23)*	4.74 *(7.62)*	1800	4.1	0.445 *(0.271)*	15.75 *(3.10)*	0.039 *(0.024)*	187 *(86)*	69 *(21)*	28.71 *(97.22)*
					9th Gear					
284.97 *(212.50)*	19849 *(88.29)*	5.38 *(8.66)*	1800	3.0	0.443 *(0.269)*	15.86 *(3.12)*	0.039 *(0.024)*	187 *(86)*	76 *(25)*	28.71 *(97.22)*
					10th Gear					
286.98 *(214.00)*	17634 *(78.44)*	6.11 *(9.83)*	1800	2.4	0.440 *(0.268)*	15.95 *(3.14)*	0.039 *(0.024)*	188 *(87)*	78 *(26)*	28.72 *(97.26)*
					11th Gear					
284.53 *(212.17)*	15408 *(68.54)*	6.93 *(11.14)*	1800	1.7	0.443 *(0.269)*	15.85 *(3.12)*	0.040 *(0.024)*	188 *(87)*	79 *(26)*	28.72 *(97.26)*
					12th Gear					
285.67 *(213.02)*	13692 *(60.90)*	7.83 *(12.59)*	1800	1.3	0.442 *(0.269)*	15.86 *(3.12)*	0.040 *(0.024)*	188 *(87)*	80 *(27)*	28.72 *(97.26)*
					13th Gear					
286.15 *(213.38)*	11474 *(51.04)*	9.35 *(15.05)*	1800	0.9	0.442 *(0.269)*	15.87 *(3.13)*	0.040 *(0.024)*	188 *(87)*	81 *(27)*	28.72 *(97.26)*

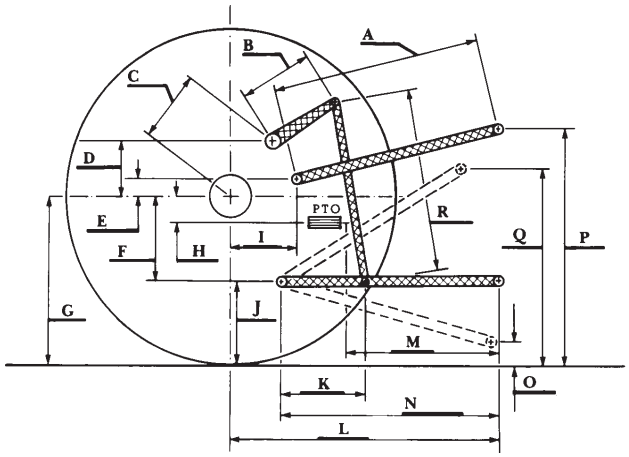
DRAWBAR PERFORMANCE
(Ballasted at 1800 engine RPM)
MAXIMUM POWER IN SELECTED GEARS

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	D.E.F. Consumption lb/hp.hr *(kg/kW.h)*	Temp.°F*(°C)* cool-ing med	Air dry bulb	Barom. inch Hg *(kPa)*
					3rd Gear					
186.00 *(138.70)*	32845 *(146.10)*	2.13 *(3.42)*	1806	7.4	0.481 *(0.292)*	14.60 *(2.88)*	0.043 *(0.026)*	186 *(86)*	71 *(22)*	28.76 *(97.39)*
					4th Gear					
239.66 *(178.71)*	31509 *(140.16)*	2.86 *(4.59)*	1899	6.9	0.489 *(0.298)*	14.35 *(2.83)*	0.042 *(0.025)*	187 *(86)*	73 *(23)*	28.77 *(97.43)*
					5th Gear					
275.31 *(205.29)*	31127 *(138.46)*	3.32 *(5.34)*	1853	6.8	0.465 *(0.283)*	15.09 *(2.97)*	0.042 *(0.026)*	188 *(86)*	74 *(23)*	28.77 *(97.43)*
					6th Gear					
281.52 *(209.93)*	28691 *(127.62)*	3.68 *(5.92)*	1800	5.5	0.449 *(0.273)*	15.62 *(3.08)*	0.040 *(0.024)*	187 *(86)*	76 *(24)*	28.77 *(97.43)*
					7th Gear					
283.85 *(211.66)*	25255 *(112.34)*	4.22 *(6.78)*	1800	4.1	0.446 *(0.271)*	15.74 *(3.10)*	0.040 *(0.024)*	188 *(86)*	78 *(25)*	28.77 *(97.43)*
					8th Gear					
288.42 *(215.07)*	22565 *(100.37)*	4.80 *(7.72)*	1801	3.1	0.438 *(0.266)*	16.02 *(3.16)*	0.039 *(0.024)*	188 *(87)*	79 *(26)*	28.78 *(97.46)*
					9th Gear					
286.42 *(213.58)*	19778 *(87.98)*	5.43 *(8.74)*	1800	2.3	0.439 *(0.267)*	15.98 *(3.15)*	0.040 *(0.024)*	188 *(87)*	79 *(26)*	28.77 *(97.43)*
					10th Gear					
289.64 *(215.98)*	17680 *(78.64)*	6.14 *(9.88)*	1800	1.9	0.436 *(0.265)*	16.09 *(3.17)*	0.040 *(0.024)*	188 *(87)*	80 *(27)*	28.78 *(97.46)*
					11th Gear					
284.64 *(212.26)*	15339 *(68.23)*	6.96 *(11.20)*	1799	1.4	0.443 *(0.270)*	15.83 *(3.12)*	0.040 *(0.025)*	188 *(87)*	81 *(27)*	28.77 *(97.43)*
					12th Gear					
285.79 *(213.11)*	13634 *(60.65)*	7.86 *(12.65)*	1801	1.1	0.442 *(0.269)*	15.86 *(3.13)*	0.041 *(0.025)*	188 *(87)*	81 *(27)*	28.78 *(97.46)*
					13th Gear					
286.36 *(213.53)*	11447 *(50.92)*	9.38 *(15.10)*	1801	0.8	0.441 *(0.268)*	15.90 *(3.13)*	0.040 *(0.025)*	188 *(87)*	81 *(27)*	28.78 *(97.46)*

HYDRAULIC PERFORMANCE

CATEGORY: III
Quick Attach: yes
OECD Static test
Maximum force exerted through whole range: 17263 lbs *(76.8 kN)*

	Standard pump	High flow pump
	3 outlet sets combined	
i) Sustained pressure at compensator cutoff:	2903 psi *(202 bar)*	2888 psi *(199 bar)*
ii) Pump delivery rate at minimum pressure and rated engine speed:	59.4 GPM *(224.9 l/min)*	85.2 GPM *(322.7 l/min)*
iii) Pump delivery rate at maximum hydraulic power:	56.0 GPM *(212.0 l/min)*	80.2 GPM *(303.4 l/min)*
Delivery pressure:	2836 psi *(196 bar)*	2739 psi *(189 bar)*
Power:	92.7 HP *(69.1 kW)*	128.1 HP *(95.5 kW)*
	single outlet set	
i) Sustained pressure at compensator cutoff:	2871 psi *(198 bar)*	2892 psi *(199 bar)*
ii) Pump delivery rate at minimum pressure and rated engine speed:	37.7 GPM *(142.5 l/min)*	39.8 GPM *(150.7 l/min)*
iii) Pump delivery rate at maximum hydraulic power:	34.6 GPM *(130.8 l/min)*	36.8 GPM *(139.2 l/min)*
Delivery pressure:	2384 psi *(164 bar)*	2368 psi *(163 bar)*
Power:	48.1 HP *(35.8 kW)*	50.8 HP *(37.9 kW)*



HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	*mm*
A	27.6	*702*
B	21.7	*550*
C	23.5	*596*
D	23.0	*583*
E	11.4	*290*
F	11.8	*300*
G	33.4	*849*
H	1.3	*34*
I	16.7	*425*
J	21.6	*549*
K	27.1	*688*
L	48.4	*1230*
*L'	52.2	*1325*
M	27.9	*709*
N	39.6	*1005*
O	9.0	*230*
P	48.6	*1234*
Q	40.2	*1022*
R	42.5	*1079*

*L' to Quick Attach ends

CHALLENGER MT755E DIESEL

Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln